STARNET
Innovating through Alliances
Strategic Alliances Resources Network, LLC

To: Airborne Internet Consortium-Founding Members

From: Paul A. Masson-StarNet

Date: 12/4/03

Re: Airborne Internet Consortium-Proposed Formation Actions & Roles

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PURPOSE

This memorandum (w/attachments) address four issues necessary to form and operate an airborne technology development consortium:

- **How Start?-** Proposed actions and roles of core founding members.
- **Why a Consortia?-** Analysis and rationale for a new consortium versus existing working groups or Government programs.
- **How Recruit and Grow a Consortia?-** Outline of information provided to recruit new members.
- **How Operate the Consortia?-** Summary of business plan for consortia operations.

The proposed consortium would be known as the Airborne Internet Consortium (AIC) and would succeed the current Airborne Internet Collaboration Group (AICG).

This memorandum also proposes roles for private and public sector representatives to undertake the formation and operation of the AIC. The long term role and phases for STARNet are provided in Appendix A.

A. HOW START: Summary of Proposed Actions and Roles

1. **Develop Airborne Internet "Stakeholders" Map-** Develop a map of "stakeholders" with interest in the formation and deployment of Airborne Internet (AI) capabilities. Develop the map based on the AI concept papers from SATS, the airborne internet briefings of April 2003 and the technical workplan of July 2003.

2. **Develop a Phased Technical Work Plan-** Develop a multi-phased approach to the technical work that permits completion as financial resources are raised from potential members and funding sponsors.

3. **Develop a Consortia Startup and Operating Plan-** Develop a business plan for the startup and operation of the AIC. The plan should be flexible and phased, to match the level of support received from potential members and funding sponsors. The phased startup plan permits for a phased technical workplan.

4. **Develop Membership Offering-** Develop a membership offering memorandum based on the business startup plan. The membership memorandum should provide for recruitment of an agreed upon set of "key organizations" identified in the stakeholder map.

5. **Recruit Core Members Form AIC and Initiate Startup**- Recruit a core of private sector AIC members developed from the membership offering form the Airborne Internet Consortium (AIC). Additional private and public sector members are solicited to complete the membership as necessary to undertake the phased technical workplan. (See Appendix A for Membership Solicitation Memorandum Outline)

6. **Provide Private Sector Leadership of Plans and Startup Using Federal Sector Input-** The analysis, planning and startup of the AIC should be undertaken solely by private sector organizations. Public sector entities, including the FAA and NASA, should be solicited to identify their "stakeholder interest" in the airborne internet concept. Public sector entities will be offered membership in a separate category.

7. **Create an AIC Formation Steering Group-** A steering group should be created to undertaken the planning and formation of the AIC. The steering group should be drawn from those organizations that have participated in the ongoing airborne internet concept development work under the SATS program and independent meetings of 2003. The core of the group could include:
    a. Boeing ATM
    b. AeroSAT
    c. PMEI
    d. CNS

   STARNet would be an advisor to the steering group and the operating AIC. (See Appendix A for STARNet AIC Formation/Operation Proposal)

B. WHY A CONSORTIA?: Background and Analysis

The above actions are based on the following background analysis and conclusions.

1. **There is an emerging market momentum seeking an advanced digital communications system to link multiple elements of the air transportation system**- The digital data communications preferences of airlines traveling to Europe and Boeing's announcement seeking airborne internet capabilities indicate market demand for advanced airborne digital data communications. The size and segments of that market are unknown.

2. **The range, interests and power of the potential stakeholders in such a communication system are unknown to any one "group" or individual-** There is currently no existing aviation or web-based industry group that touches such a wide range of interests. AIRNC and RTCA respectively represent interests in current airborne communication operations and standards setting. The SWIN group is still in formation. The nexus between these groups represents the area where new "systems" concepts are developed concurrently along with their associated standards. None of the existing aviation or web-based industry groups sufficiently cover all stakeholders. There is no aviation transportation consulting firm (e.g. Gelman), research group (e.g. Volpe) that has identified the stakeholders in such a system. It is possible that the research undertaken by the Glenn Research Center (GRC) may have touched on all of the elements of such a system except the content providers.

3. **The airborne internet concept as defined in SATS has the potential to meet a wide range of the known "stakeholder" interests and issues-** The concept of airborne internet incorporates is based on the idea of creating a common but neutral "communications network capability". This concept maximizes the ability to meet multiple interests in the existing and potential aviation communications system.

4. **Agreement on Operational Concepts, Systems Architectures and Standards (Common Ground) is key to satisfying a variety of those stakeholder interests-** The majority of private sector stakeholders are seeking to benefit from applications and deployment of airborne internet to specific needs. The Federal sector stakeholders are seeking a single approach to maximize safety and ease of integration into the existing legacy system.

5. **Formation of a neutral, broadly based consortia is growing as a private sector method to developing concepts, architectures and standards among a fluid group of "stakeholders"-** The formation of private consortia open to any qualified member is growing within the private sector as a method to develop the "common ground" the permits companies to focus on specific product development. The alternatives of competing systems concepts and drawn-out-processes of standards setting bodies do not permit rapid deployment of products to market.

6. **Formation of a successful broadly based consortia requires private sector leadership**- There are approximately fifteen (15) federally initiated technology consortia compared to at least one-hundred (100) initiated by the private sector subsequent to changes in anti-trust legislation (1984). All but one of the federally initiated technology consortia were launched under Clinton Administration policies that no longer guide Federal involvement in long term research and development.

7. **The Airborne Internet Collaboration Group (AICG) has the knowledge but not the sponsorship, organizational structure, or membership to launch such a consortia**- The core of sponsoring organizations for a consortia must represent a critical mass of resources, influence and public image to draw in additional membership. The commitment for core organizations must come from senior management with authority to commit the full organization, and not a single engineering advocate within its ranks. The AICG has not been organized or operated to solicit such a form of core sponsorship.

8. **Launching a new AIC based on the AICG knowledge will require a carefully managed startup and membership recruitment plan based on a phased technical work plan-** A consortia is often launched from a core of knowledgeable individuals that build the consortia similar to building a new company. That core of individuals exists within AICG, but they must now form a small working group (Steering Committee) to develop the consortia plan and recruit a core of members.

C. HOW RECRUIT AND GROW A CONSORTIA?

The formation of the consortia will require the core Steering Group and founding members to both offer membership to all, plus solicit key organizations whose participation is necessary to achieve the objectives. The form of solicitation will require providing a "prospectus" regarding the consortia, its activities, and the value to members. The draft outline of such a membership solicitation is provided below:

1.0 Summary of Consortia Membership Solicitation
- 1.1 Airborne Internet Consortia Description
- 1.2 Membership: Conditions, Obligations, Types, Rights and Value
- 1.3 Letter of Intent
- 1.4 Participation: Notification, Qualification

2.0 Summary of Airborne Internet Consortia
- 2.1 Charter
- 2.2 Objectives
- 2.3 Organization: Legal Vehicle, Governance, Management and Technical Committees
- 2.4 Outputs: Guidelines for Standards and Certification
- 2.5 Membership Dues and Technical Contributions
- 2.5 Value to Members

3.0 Airborne Internet Consortia Concept
- 3.1 Airborne Communications Needs
- 3.2 Current Situation
- 3.3 Concept: Generic AI Service Model
  - 3.3.1. Transport Services
  - 3.3.2. Subnetworks
  - 3.3.3 Air-Ground (Mobile) Subnetworks
  - 3.3.4 Airborne Network
- 3.4 System:
  - 3.4.1. Airborne Internet Protocol Stack
  - 3.4.2.Capabilities and Desired Features of an Airborne Internet
    - 3.4.2.1. Open Standards
    - 3.4.2.2. Efficient for Both Short and Long Messages
    - 3..4.2.3. Supports Broadcast and Multicast
    - 3..4.2.4. Supports Reliable Addressed Messaging
    - 3..4.2.5. Support for Priority-Based Messaging
    - 3.4.2.6. Provisions for Mobile Routing
    - 3.4.2.7. Quality of Service
    - 3.4.2.8. Network Management
    - 3.4.2.9. Security
    - 3.4.2.10. Provisions for Link-independent Routing
  - 3.4.3. Services

4.0 Consortia Organization
- 4.1 Legal Structure
- 4.2 Governance
- 4.3 Management: Officers, Background and Remuneration
- 4.4 Technical Working Group

5.0 Membership
  5.1 Qualifications
  5.2 Categories
  5.3 Entry and Exit
  5.5 Transferability

6.0 Consortia Startup and Operations
  6.1 Consortia Formation
  6.2 Phase 1: Preliminary Technical Planning
  6.3. Phase 2: Full Technical Team Work
  6.4. Ongoing Consortia Operation
    6.4.1 Technical Work
    6.4.2 Consortia Management

7.0 Consortia Outputs
  7.1 Technical Reports
  7.2 Patents, Copyrights and Datarights
  7.2 Technical Demonstrations

8.0 Intellectual Property
  8.1 Joint Consortia Held Property
  8.2 Membership Rights by Category

8.0 Standards Bodies Working Relationships
  8.1 FAA
  8.2. WWW
  8.3 AIRNC

9.0. Conversion and Closure
  9.1 Sunset Provisions in Governing Documents
  9.2 Options for Closure or Continuance

10.0 Financial Projections
  10.1 Revenue and Expense (3 Years)
  10.2 Assets and Liabilities (3 Years)

D. How Operate the Consortia?

Draft-Startup Business Plan
Airborne Internet Consortium

Mission: What is the mission of the consortia?

To define, develop and promote the common systems elements necessary to deploy comprehensive aviation based digital datalink capabilities throughout the nation using evolving internet capabilities

Objectives: What objectives will the consortia achieve?

- Create airborne internet guiding principles
- Create an airborne internet Operational Concept
- Create and evaluate airborne internet Systems Architectures
- Develop airborne internet implementation roadmap
- Influence, tailor or create standards
- Advocate the capability of airborne internet

Common Needs: What common usage needs will be satisfied? How are those needs expressed as groups of needs?

The consortia's principles, ops cons and architectures will provide standards and guidelines for:

- Airplane Cockpit Communications
- Airplane Passenger Communications
- Aircraft as Mobile Routers for Internet

Outputs: What will be the outputs of the consortia?

- Research Studies- All research reports are copyrighted and treated as member datarights.
    - National airborne internet operations concept
- Standards and Guidelines Reports- All standards and guidelines reports prepared for release into the public domain.
    - National airborne internet standards
    - Guidelines for airborne internet product certification
- Ongoing Services- All ongoing standards liaison services provided to members as long as necessary to achieve the targeted goals for influencing and/or creating standards.
    - Standards liaison working groups

Delivery: How will the outputs be delivered to members and users?

- Research Studies- Delivered to members via their participation in project teams and an annual membership research results meeting.

- Standards- Proposed standards delivered via consortia members funded to participate in standards setting bodies on behalf of the consortia.
- Certification Guidelines- Delivered to members and the FAA via an annual certification research meeting between consortia members and the certification managers of the FAA.

Legal Vehicle: What will be the legal vehicle of the consortia?

Delaware non-profit corporation chartered to undertake activities that are science, research and education. Registered as a tax-exempt organization (501-c-3).

Membership Structure, Rights and Obligations: What will be the structure, rights and obligations of the consortia members?

Four categories of membership according to type of legal status and interest in the airborne internet:

CATEGORY	DESCRIPTION	OBLIGATIONS/RIGHTS
Business/Academic-Principal	All for profit organizations and educational/research institutions	Pay dues; fund research; direct research; receive reports; receive licenses; attend annual meetings
Business/Academic-Supporting	Ditto	Pay dues; receive reports; attend annual meetings
Government	All Federal, state and local government organizations.	Pay dues; fund research; receive reports; receive government use license; attend annual meetings
Individuals	All individuals	Pay dues; attend annual meetings

There are two levels within the Business/Academic category: Full members and Supporting members. Full members contribute research and development resources to complete the research program, and have rights to determine the strategic and tactical direction of the consortia research. Full members receive rights to all research report outputs and any licensed technology. Supporting members do not contribute research and development resources to complete the research program, have no rights to determine the research direction, can be paid by Full members to undertake the research and have rights to the research reports but not to licenses on developed technology.

Governance: What will be the governance structure of the consortia?

A nine member board of directors elected from among the membership. The first members will be tiered to have overlapping terms with three members expiring every other year. Directors are elected only from among the Full members of any given class.

Organization Structure: What will be the organization structure of the consortia?

The consortia will be organized into three functioning groups: a management group; technical working groups; a business administration function. The management group will be composed of one professional full time project manager, and assigned project managers from the members. The technical working groups will be composed of the following:

- Technical Committee- Technical Committees are formed around areas of ongoing research for the Consortia.
- Architecture Board- The Architecture Board is vested with responsibility to develop optional architectures, and assure that any technical work fits within one of the optional architectures. It will be the eventual responsibility of the Architecture Board to present a "recommended architecture" to the Board of Directors.
- Task Forces- A task force is formed whenever a technical committee is anticipating undertaking a new program, project or field of work. The role of the task force is to develop specifications for the program/project.

Management: What will be the management structure of the consortia?

Limited to two managers (Executive Director, and Research Projects Director), both part time on employment contracts controlled by the Board.

Operations Structure: What will be the operations structure of the consortia?

The consortia will operate with only basic project management functions. As many functions as possible will be contracted out to a professional trade association management firm.

Timing: What will be the timeline of the consortia's activities?

The consortia will startup and operate in three phases. The phases approach is designed to match the current knowledge of likely resource sources and timing of support to initiate consortia activities.

- Phase 1 is startup over a period of one year;
- Phase 2 is definition of concepts at sufficient level to fully secure resources for complete research;
- Phase 3 is full research resulting in standards and certification guidelines.

Resources Source: What will be the source of resources for the consortia's operating budget?
The consortia's research and project management functions will be supported by a combination of member contributions and solicitation for government program funding. The consortia's business management will be supported by member dues and cost recovery on project overhead.

Pricing Structure: Member Dues and Seats: What will be the pricing structure for member dues? How many "seats" in working committees will the dues provide?
The pricing structure will vary according to class and level of membership. A preliminary pricing structure is:

Type	**Dues**	**Seats**
Founding	$ 10,000 one time	
Business/Academic-Principal	$ 6,000 per annum	Six Seats
Business/Academic-Supporting	$ 1,000 per annum	One Seat
Government	$ 1,500 per annum	Six Seats
Individual	$ 250 per annum	One Seat

Operating Budget: What will be the budget of the consortia?

- Phase 1-Startup:
    - Research- $300,000 est.
    - Management and Operations- $85,000 minimum to $115,000 maximum
- Phase II budget:
    - Research- $2,500,000
    - Management and Operations- $215,500 to $245,000
- Phase III Budget
    - Research- $26,500,000
    - Management and Operations- $1,850,000 to $2,275,000

Public Image: Neutral organization the concurrently creates technology systems and works to establish open and accessible standards.

Public Image Messages and Differences

Themes and Messages	• The transportation market is already demanding improved air transport communication. • Current FAA capabilities only satisfy a limited part of public communication demand, because of the combination of existing momentum for communications • The existing private sector internet contains both the concept and open systems to bring improved communication to the aircraft • The AIC coalition would provide a common voice for the private sector vision of such a system. • The AIC vision could guide both public and private sector investment in a coordinated manner to meet public demand for air-transport communications